

WE CLAIM:

1. A circuit for controlling gain of a first amplifier, the circuit comprising:
 - a first portion for receiving a first input signal and a second input signal from the a second amplifier, and to produce a first output signal that is an inverse logarithmic function of a combination of the first input signal and the second input signal; and
 - a second portion for digitally processing the first output signal and to produce a second output signal that controls the gain of the first amplifier.
2. The circuit of claim 1, wherein the first portion is configured to receive the first input signal and the second input signal from a first mixer and a second mixer that are each operably connected between the second amplifier and the first portion.
3. The circuit of claim 1, wherein the second portion comprises a comparator for comparing the first output signal to a threshold.
4. The circuit of claim 3, wherein the comparator is configured to switch the gain of the first amplifier when the threshold is reached.
5. The circuit of claim 3, further comprising a resistive-divider-based circuit for specifying a value of the threshold.
6. The circuit of claim 5, wherein the resistive-divider-based circuit is independently programmable.
7. The circuit of claim 6, wherein the resistive-divider-based circuit is 4-

bit programmable.

8. The circuit of claim 1, wherein the first portion comprises at least two biasing circuits that are cascaded.
9. The circuit of claim 1, wherein the first output is operably connected to VDD.
10. A method of controlling gain of a first amplifier, the method comprising the steps of:
 - receiving a first input signal and a second input signal from a second amplifier in a first portion of a circuit;
 - producing a first output signal in the first portion that is an inverse logarithmic function of a combination of the first input signal and the second input signal;
 - forwarding the first output signal to a second portion of the circuit;
 - digitally processing the first output signal in the second portion to produce a second output signal; and
 - controlling the gain of the first amplifier using the second output signal.
11. The method of claim 10, wherein the digitally processing step comprises comparing the first output signal to at least two switching thresholds.
12. The method of claim 11, further comprising the step of setting the at least two switching thresholds using resistive divider-band circuits.
13. The method of claim 11, further comprising the step of providing 4-

bit independent programmability for each of the at least two switching thresholds.

14. The method of claim 10, further comprising the step of reducing fluctuation due to power supply variation by shorting the first output signal and threshold outputs to VDD through resistors.
15. The method of claim 10, wherein the controlling step comprises maintaining the first input signal in a range over which the first portion of the circuit varies the first output signal linearly in response to variations in the combination of the first input signal and the second input signal.
16. The method of claim 10, further comprising the step of providing cascaded mirror devices in the circuit to reduce fluctuation of the second output signal.
17. The method of claim 10, further comprising the step of mixing the first input signal and the second input signal after the first input signal and the second input signal are generated by the amplifier.
18. A circuit configured to control gain of an amplifier, the circuit comprising:
 - receiving means for receiving a first input signal and a second input signal from the amplifier;
 - first production means for producing a first output signal that is an inverse logarithmic function of a combination of the first input signal and the second input signal;
 - processing means for digitally processing the first output signal; and

second production means for producing a second output signal that controls the gain of the amplifier.

19. The circuit of claim 18, further comprising mixing means for mixing the first input signal and the second input signal after the first input signal and the second input signal are generated by the amplifier.